The Utah Microtechnology Consortium Project

Executive Summary for Meeting of University Presidents
July 17, 2001

Project Framework

- Utah's infrastructure cannot support existing or future needs for microtechnology-related education, research or economic development.
- Many groups are independently discussing expansion of microtechnology programs and facilities.
- An opportunity exists to form a microtechnology consortium to serve and enhance existing and future efforts.
- A second and related opportunity exists to establish a large, shared-use microfabrication facility.
- Temp names: Utah Microtechnology Consortium (UMC), Utah Center for Applied Microtechnology (Center)

Introduction

- A semiconductor manufacturer contacted BYU about donating substantial microfabrication equipment.
- The potential donation includes a complete 6-inch integrated circuit (IC) fabrication "line" and significant support equipment valued near $100 million.
- The donation is too large for BYU to accept alone:
  - the equipment would require a large, expensive, dedicated facility
  - the facility would be too big to effectively utilize with limited students and faculty
  - the equipment and facility would be expensive to operate and maintain – est. $4 to $6 million/yr.
- BYU is willing to channel the donation into a new, independent, non-profit entity for shared use.
- With pooled resources, a successful multi-institutional program and facility might be created and operated.
- The potential economic and educational impact is too good not to explore seriously.

Current Project Status

- Consultant engaged by MEP to research the project feasibility and draft a "straw-man" business proposal
- Letters from Governor, BYU to donor requesting Non-binding Letter of Intent are nearly complete
- Preliminary discussions with all higher-ed institutions on-going, positive
- Found: over 60 university-based microfabrication facilities in the US; few have 6-inch capabilities.
- Top programs at Arizona, Berkeley, Cornell, Michigan, MIT, Stanford, Texas, Rochester and Albany.
- Preliminary meetings with small and large industry partners on-going, look promising
- Preliminary findings: similar programs suggest predictable and positive impact in all community sectors.

Anticipated Impact of the UMC and Center		
Educational Impact	**Research Impact**	**Economic Impact**
• More and better coursework	• Increased research capabilities	• Better/retained local talent pool
Expanded curriculums/degrees	• Improved faculty recruiting	• Accelerated tech'y incubation
• Enhanced workforce training	• More high $ contracts/grants	• Improved corporate recruiting
• Better $ for enrolled students	• Greater sponsored research	• Expanded tech'y infrastructure
• Better $ and jobs for graduates	• Enhanced tech transfer	• Local access to $$ equip't

Draft Mission and Vision

- #1 Mission: to provide industry-relevant education and training for scientists, engineers and technicians
- #2: Serve as a catalyst and accelerator for new microtechnology ventures, products, and business growth.
- #3: Create a distributed, multi-institutional infrastructure that enables premier research opportunities
- The Center will serve as a contract facility for companies requiring prototypes and or small quantity runs
- The cross-disciplinary, cross-functional operations will support team-oriented education and training.
- Technology focus will encompass many disciplines around advanced process and product development

Microtechnology Directions in Utah

- Current Utah Higher-Ed Projects
  - UVSC, SLCC, others(?) discussing expansion of credit and non-credit microtechnology programs
  - USU researchers and administrators assessing needs and planning for growth
  - USU Space Dynamics Lab building a large, internal-use only cleanroom
  - UU currently renovating and expanding out-dated HEDCO microfabrication teaching laboratory
  - UU advancing "UFab" proposal to build very large cleanroom facility for research and teaching
- Industry asking for coordinated effort, comprehensive vision for Utah's microtechnology future
- State economic and educational programs benefit from and converge with UMC/Center initiative.

Organizational Structure

1. Consortium could be formed as new, independent 501(c)3 non-profit entity.
   - Directed by Board of Trustees from each of the participating members.
   - Advice and guidance from two advisory boards: Industrial Advisory Board, Academic Advisory Board
2. Facility governed by non-profit Board of Trustees
   - Facility managed by Trustees-hired Director
   - Facility run by full-time, on-site staff of administrative and operations professionals plus students.

Physical Building and site for Facility

- Proposed equipment, support, and non-cleanroom space required would be 100,000 to 150,000 SqFt depending on availability of adjacent classroom, conference, and office space at selected site.
- App'x 10,000 SqFt of discrete Class 10 and Class 100 cleanroom for major process/research bays
- App'x 10,000 SqFt of discrete Class 1000 cleanroom for research labs, etc.; 20,000 more convertible.
- Development/production supported with a central 'backbone' for 0.5 micron CMOS baseline processing
- A second, flexible 'line' is anticipated for non-standard process R&D on a wide variety of substrates

Option 1: Build a New Building	Option 2: Renovate an Existing Building
➢ Est. 18-24 Months from Go to Open	➢ Est. 12-18 months from Go to Open?
➢ Est. $40-50 million for total project	➢ Est. $30-40 million for total project?
➢ Best flexibility for site, design, future needs	➢ Limited sites, design, future flexibility
➢ Time delay may trouble or inhibit donors	➢ Faster build may enable donations

- Possible build sites: Thanksgiving Point, Fairchild property, Riverton Site, SLCC, more?
- Several entities interested in donating land
- Proximity and access to highway, power, water, telecom, and incubator/research park space are important

Phase 1

- Principal Phase 1 activities and tasks include:
  - Description and analysis of university-based facilities
  - Interviews with potential participants and industry experts
  - Preliminary market research and business analysis of the opportunity
  - Develop organizational structures and preliminary project timelines
  - Draft financial models for the organization's planning, facility build-out, and on-going operations.
- Preliminary results suggest that the UMC/Center could be successful if three barriers can be surmounted:
  1) Substantial cash flow for on-going operations must be aggressively pursued and managed;
  2) Equipment capabilities and limitations must be carefully matched with demand-driven education, research, and service programs;
  3) Member institutions and companies must be able to conveniently access the facility and gain mutual benefit from non-competitive collaboration.

Phase 2

A second phase of feasibility planning is proposed to complete all materials for a final Go/No-Go decision.

- Expected completion is Sept. 7, 2001 (before Go/No-Go summit meeting at Gov's Mansion, Sept. 13-14)
- Expected Phase 2 budget is approximately $35,000 -$40,000
- Principal Phase 2 activities and tasks include:
  - Create academic, business, and site selection committees
  - Perform site visits to donors, model facilities
  - Complete market opportunity analysis, define vision and purpose for consortium, facility
  - Complete and validate value models for education, research, and economic impact
  - Pursue and secure additional commitments for equipment, capital, and in-kind contributions.
  - Develop building design, layout, and construction plans for either New Build or Renovate option
  - A facility site and land donation will be researched, selected and a commitment secured
  - Financial models for launch and 5-year operations will be completed and validated

Contacts

A master project contact list for all Academic, Government, and Business interests is available from:
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